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Randall K. Curey

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EXAMINER

LEE, PHILIP C

ART UNIT

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2448

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

09/821,537

**Applicant(s)**

CUREY ET AL.

**Examiner**

PHILIP C. LEE

**Art Unit**

2448

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

**DETAILED ACTION**

1. This action is responsive to the amendment and remarks filed on April 1, 2009.
2. Claims 1-49 are presented for examination.

*Objection*

3. Claims 5 and 20-21 are objected to because of the following typographical error: claim 5, "of the of the given"; Claim 20, line 5, "pacakges"; claim 21, line 3, "of the of the"

*Claim Rejections – 35 USC 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 4-9, 19-20, 22-27, 29-34, 44-45 and 47-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Blum et al. (US 4,109,311), hereafter "Blum".

6. As to claim 1, Blum discloses the invention as claimed including a method for repetitively executing (col. 5, lines 35-42; and col. 6, lines 50-52) a plurality of software packages at one or more rates (the program requiring the greatest amount of processing time is allocated a greater number of time slices, col. 3, lines 47-54; fig. 3; col. 5, lines 24-42), utilizing a common set of computational resources (col. 3, lines 42-44), the method comprising: assigning a sequence of time intervals to each software package of the plurality of software packages (col. 1, lines 11-23; col. 3, lines 41-54; and col. 6, lines 2-9), the sequence of time intervals assigned to a particular software package of the plurality of software packages not overlapping the sequence of time intervals assigned to any other software package of the plurality of software packages (col. 3, lines 40-46); executing a subset of the plurality of software packages (abstract, lines 2-6; col. 2, lines 15-25), each respective software package in the subset plurality of software packages being executed during predetermined time intervals defined by the sequence of time intervals assigned to the respective software package in the subset of the plurality of software packages (abstract, lines 6-8; col. 1, lines 19-24; col. 3, lines 47-54; col. 6, lines 2-9; col. 7, lines 1-3).

7. As to claim 25, the claim is rejected for the same reasons as claim 1 above. In addition, Blum discloses an apparatus for practicing the method of claim 1 (Fig. 5).

8. As to claim 26, the claim is rejected for the same reasons as claim 1 above. In addition, Blum discloses an apparatus for repetitively executing (Fig. 5; and col. 5, lines 35-42; and col. 6, lines 50-52) a plurality of software packages at a plurality of rates (the program requiring the

greatest amount of processing time is allocated a greater number of time slices, col. 3, lines 47-54; ; fig. 3; col. 5, lines 24-42), the apparatus comprising: a means for generating and assigning a sequence of time intervals to each software package of the plurality of software packages (col. 1, lines 11-23; col. 3, lines 41-54; and col. 6, lines 2-9), the sequence of time intervals assigned to a particular software package of the plurality of the plurality of software packages not overlapping the sequence of time intervals assigned to any other software package of the plurality of software packages (col. 3, lines 40-46); a means for executing a subset of the plurality of software packages (abstract, lines 2-6; col. 2, lines 15-25; and Fig. 5), each respective software package in the subset of the plurality of software packages is executed during predetermined time intervals defined by the sequence of time intervals assigned to the respective software package in the subset of the plurality of software packages (abstract, lines 6-8; col. 1, lines 19-24; col. 3, lines 47-54; col. 6, lines 2-9; col. 7, lines 1-3).

9. As per claims 2 and 27, Blum further teach comprising the step: utilizing one or more tests to identify the plurality software packages that are valid (col. 4, lines 47-61), and wherein the subset of the plurality of software packages includes only valid software packages (col. 4, lines 47-61).

10. As per claims 4 and 29, Blum further teach wherein a given software package of the plurality of software packages is assigned a dedicated memory region, a given test of the one or more tests for validity being whether an address returned for an initialization procedure of the

given software package of the plurality of software packages lies within the dedicated memory region of the given software package of the plurality of software packages (col. 4, lines 47-61).

11. As per claims 5 and 30, Blum further teach whether the address is returned for the initialization procedure of the given software package of the plurality of software packages within a predetermined time (col. 7, lines 1-10).

12. As per claims 6 and 31, Blum further teach wherein a given software package of the plurality of software packages is assigned a dedicated memory region, the dedicated memory region of the given software package of the plurality of software packages including a stack memory region and/or a heap memory region, a given test of the one or more tests for validity being whether the stack memory region and/or the heap memory region assigned during the execution of an initialization procedure of the given software package of the plurality of software packages and various associated entry points lies within the dedicated memory region assigned to the given software package of the plurality of software packages (col. 4, lines 47-61).

13. As per claims 7 and 32, Blum further teach whether the stack memory region and/or the heap memory region and the various associated entry points are returned within a predetermined time (col. 7, lines 1-10).

14. As to claims 8 and 33, Blum discloses a given software package of the plurality of software packages is assigned a dedicated memory region (fig. 3; col. 3, line 65 to col. 4, line 13; and col. 4, lines 50-54).

15. As per claims 9 and 34, Blum further teach the dedicated memory region assigned to the given software package of the plurality of software packages includes a stack memory region in which a stack of the given software package of the plurality of software packages resides (30, 33, fig. 2; col. 4, lines 14-46).

16. As per claims 19 and 44, Blum further teach each software package of the plurality of software packages is assigned a memory block (30,33, fig. 2), a given software package of the plurality of software packages being configured to read data only from zero or more memory blocks associated with other software packages of the plurality of software packages, the zero or more memory blocks readable by the given software package of the plurality of software packages being either predetermined or determined during execution of the given software package of the plurality of software packages in accordance with a set of one or more rules (col. 4, lines 14-46).

17. As per claims 20 and 45, Blum further teach each software package of the plurality of software packages is assigned a memory block (30,33, fig. 2), a given software package of the plurality of software packages being configured to write data only to zero or more memory blocks associated with other software packages of the plurality of software packages, the zero or

more memory blocks writeable by the given software package of the plurality of software packages being either predetermined or determined during execution of the given software package of the plurality of software packages in accordance with a set of one or more rules (col. 4, lines 14-46).

18. As per claims 22 and 47, Blum further teach a presence of subset of the plurality of software packages of the plurality of software packages is detected (col. 4, lines 34-61).

19. As to claims 23 and 48, Blum discloses one or more software packages is independently compiled, linked, and loaded (col. 3, line 65 to col. 4, line 13; and col. 4, lines 50-54) (i.e., programs are transfer to control storage (loading) and executed (col. 4, lines 4-33) (compiling). Blum et al further teach pointer linking a program to be executed (col. 4, lines 47-61) (linking)).

20. As per claims 24 and 49, Blum further teach each software package of the plurality of software packages has a stack, that is selected prior to executing the software package (30, 33, fig. 2; col. 4, lines 14-46).

*Claim Rejections – 35 USC 103*

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are



such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 3 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum in view of Slivka et al, U.S. Patent 5,493,649 (hereinafter Slivka).

23. As per claims 3 and 28, Blum teaches the invention as claimed in claims 2 and 27 above. Blum does not teach one's complement checksum test. Slivka teaches a given test of the one of the tests for validity is a one's complement checksum test of a software package's program memory data (col. 1, lines 56-67; col. 4, line 51-col. 5, line 2).

24. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Slivka because Slivka's teaching of one's complement checksum test would allow Blum's system to validate a program when multiple programs are executing within the memory.

25. Claims 10-11 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum in view of Douceur et al, U.S. Patent Application Publication 2005/0132375 (hereinafter Douceur).

26. As per claims 10 and 35, Blum teaches the invention as claimed in claims 1 and 26 above. Blum does not teach background tasks as well as foreground tasks. Douceur teaches

background tasks as well as foreground tasks, the background tasks being performed after the foreground tasks have been completed ([0005]).

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Douceur because Douceur's teaching of background tasks and foreground tasks would increase the efficiency of Blum's system by allowing a background process to be operated when no other priority process is using the processor.

28. As per claims 11 and 36, Blum and Douceur teach the invention substantially as claimed in claims 10 and 35 above. Douceur further teach a background task is an infinite loop ([0048]).

29. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Douceur for the same reason as claim 10 above.

30. Claims 13-17 and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum in view of Skagerling, U.S. Patent 5,621,663 (hereinafter Skagerling).

31. As per claims 13 and 38, Blum teaches the invention as claimed in claims 1 and 26 above. Blum does not teach a failure log. Skagerling teaches a failure in the execution of a given software package causes information to be logged in a failure log (col. 4, lines 54-57).

32. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Skagerling because Skagerling's teaching of failure log would increase the alertness of Blum's system by allowing logged failure to be reported and analyzed.

33. As per claims 14 and 39, Blum and Skagerling teach the invention substantially as claimed in claims 13 and 38 above. Skagerling further teach a failure in execution is linked to the given software package that caused the failure (col. 2, line 51-col. 3, line 6).

34. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Skagerling for the same reason as claim 13 above.

35. As per claims 15 and 40, Blum and Skagerling teach the invention substantially as claimed in claims 13 and 38 above. Skagerling further teach wherein quality of performance in executing the given software package is represented by one or more performance-quality parameters (col. 3, lines 57-63), values of the one or more performance-quality parameters being determined from the information logged in the failure log, the execution of the given software package being subject to a plurality of execution options, an execution option being selected on the basis of the values of the one or more performance-quality parameters (col. 5, line 64-col. 6, line 6).

36. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Skagerling for the same reason as claim 13 above.

37. As per claims 16 and 41, Blum and Skagerling teach the invention substantially as claimed in claims 15 and 40 above. Skagerling further teach the plurality of execution options are user configurable (col. 4, lines 37-41).

38. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Skagerling for the same reason as claim 13 above.

39. As per claims 17 and 42, Blum and Skagerling teach the invention substantially as claimed in claims 15 and 40 above. Skagerling further teach wherein the performance-quality parameters include the number of failures and/or the rate of failures for one or more classes of failures recorded in the failure log (col. 5, line 57-col. 6, line 6).

40. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Skagerling for the same reason as claim 13 above.

41. Claims 18 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum in view of Herbert et al, U.S. Patent Application Publication 2006/0015719 (hereinafter Herbert).

42. As per claims 18 and 43, Blum teaches the invention as claimed in claims 1 and 26 above. Blum does not teach safety-critical software. Herbert teaches safety-critical software is placed in one or more separate partitions thereby isolating the safety-critical software from non-safety-critical software ([0021], [0025], [0041]).

43. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Herbert because Herbert's teaching of safety-critical software would improve the reliability of execution in Blum's system by allowing system critical software to be executed in isolation in order avoid interface caused by other non-critical software failure.

44. Claims 21 and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum in view of Reznak, U.S. Patent 6,223,201 (hereinafter Reznak).

45. As per claims 21 and 46, Blum teaches the invention as claimed in claims 1 and 26 above. Although Blum teaches an executive software package enforces the discipline that each of the one or more software packages of the plurality of software packages being executed software package executes only during the time intervals of its sequence of time intervals (col. 1, lines 17-60), however, Blum does not teach when the execution of a software package extends

into a time interval assigned to another software package. Reznak teaches the executive software package determining when the execution of the respective software packages of the plurality in the subset of the software packages is executed a software package extends into a time interval defined by the sequence of time intervals assigned to at least one different software package in the subset of the plurality of software packages and performs a remedial action (col. 5, lines 10-15; col. 6, lines 24-32).

46. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum and Reznak because Reznak's teaching of determining when the execution of any one of the one or more software packages of the plurality of software packages being executed a software package extends into a time interval belonging to the sequence of time intervals assigned to another of the one or more software packages would increase the flexibility of Blum's system by allowing adjustment of the assigned time intervals for execution by the programs.

47. Claims 12 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blum and Douceur in view of Flannery, U.S. Patent 5,826,092 (hereinafter Flannery).

48. As per claims 12 and 37, Blum and Douceur teach the invention substantially as claimed in claims 10 and 35 above. Blum and Douceur do not teach minimize the power utilized. Flannery teaches causing the power utilized in executing the given software package to be minimized after completion of the background tasks (col. 3, lines 51-58).

49. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blum, Douceur and Flannery because Flannery's teaching of minimize the power utilized would increase the efficiency of Blum's and Douceur's systems by allowing their system to conserve more power.

50. Applicant's arguments filed 4/1/2009 have been fully considered but they are not persuasive.

51. In the remarks, applicant argued that:

- (1) Blum fails to teach a sequence of time intervals are assigned to each software package of a plurality of software packages, and that a subset of the plurality of software packages are executed during predetermined time intervals defined by the assigned sequences of time.
- (2) The combination of Blum and Harris in rejecting claims 21 and 26 is not obvious.

52. In response to point (1), teaches sequences of time slices in a time cycle are allocated to each program of the plurality of software programs (col. 3, lines 41-44), and that one of the program (subset) are executed during the allocated time slices (e.g., program 0 is executed during slices 1 and 2, predetermined time intervals) (col. 3, lines 46-54) defined by the allocated sequences of time (defined by the time slices in the time cycle).

53. In response to point (2), applicant's argument is moot in view of new ground of rejection.

### CONCLUSION

54. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ferguson et al, US 5210872; Turner et al, US 6505229.

55. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip C Lee whose telephone number is (571)272-3967. The examiner can normally be reached on 8 AM TO 5:30 PM Monday to Thursday and every other Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Firmin Backer can be reached on (571) 272-6703. The fax phone number for the organization where this application or proceeding is



assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Philip C Lee/

Primary Examiner, Art Unit 2452